DETAILED ACTION

Response to Arguments

Applicant's arguments, filed 7/12/11, with respect to the rejection(s) of claim(s) 1, 2, 4, 9-14, 16, 21, 22, 27-37, 42-45 and 51-61 as being unpatentable over Hansen et al (6,672,865) in view of Dunne et al (6,440,356) under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Hansen et al in view of Joshi et al (6,210,151).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 4, 9-14, 16, 21, 22, 27-37, 42-45 and 51-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hansen et al (6,672,865) in view of Joshi et al (6,210,151). Hansen et al** a kiln system (10) for mixing process gas flow that flows through housing (12) of an exhaust gas bypass system (SEE Figures 1-4) including a precalciner and riser duct, wherein the kiln system is for preparing cement clinker (SEE Summary of Invention) and has a gas temperature between 850-1400 degrees Celsius (SEE column 13, lines 27-38) and includes a plurality of injectors (32) arranged at angles of between 0 to 60 degrees at predetermined intervals around the cross section

of the interior of the housing (SEE Figure 6) and are connected to a gas supply system (34) which includes a fan, blower or compressor which is operable to feed pressurized air (or preheated) of high energy/velocity (a jet), to the injectors to produce rotational momentum in the kiln gas stream to dissipate stratification (column 9, lines 23-35) such that kiln gas is entrained in the injected gas along the axis of the housing, a combination of the position of the injectors within the kiln system and the nozzles (36) aid in imparting the rotational momentum (swirling) (Figure 7 illustrates the inherent gas flow out of the nozzles as affected by the flattened fronts shown in Figures 8a & 8b **as it enters the housing of the kiln system**) and as can be seen in the Figures 8a & 8b have angles which anticipate the applicants claim 4 and the injectors are capable of impinging tangentially on an imaginary circle which forms towards the center of the housing as suggested by the flow shown in Figure 6 of high pressure air exiting the nozzles (36). Based off the illustration of Figure 6, a person having ordinary skill in the art would recognize and conclude that at least 10 percent of the cross sectional area of the housing is covered by the circle of air flow, additionally the claims directed to the velocity of the injection gas as measured in Reynolds Number or the frequency of turbulence or the calculation in which these values are determined are not novel limitations which cannot be performed by the structure of Hansen et al. As previously mentioned, Hansen et al includes nozzles (36) which are configured to impart some rotational momentum to the gas that flows through the nozzle conduit, (SEE Figures 8a & 8b shows end portions with slots which inherently functioning as vanes (ie swirling means) or bluff bodies since they consist of a flattened front), however Hansen et al

does not particularly disclose swirl vanes positioned within the injector thus providing axial swirl along the axis of the injector. Joshi et al teaches that it is known in the art of furnaces of high temperature and high particulate to include a gas injector (2) which includes swirl vanes (24) located inside the injector (SEE Figure 3) for imparting a strong rotational or swirling motion to a gas mixture stream emerging from the injector as it enters the housing of the furnace for the benefit of introducing better mixing conditions between fuel and oxidant without over heating or causing chemical corrosion damage to its structure. A person having ordinary skill in the art at the time the invention was made would have found it obvious to have modified the injectors of Hansen et al by substituting the injectors as taught by Joshi et al and thus improve the overall structure by having an injector with internal swirl vanes to create a swirling motion of the injected gas which will provide better mixing with the process gas that flows through the housing of Hansen et al.

Allowable Subject Matter

Claims 23-26 are allowed.

Response to Arguments

Applicant's arguments filed 7/12/11 have been fully considered but they are not persuasive. The Examiner acknowledges the applicants incorporation of reference numeral (130) as assigned to the axial swirl (130) along the axis of the injector of the injection gas of which neither Hansen nor Dunne discloses; in particular there is no swirl

applied to the injected gas as it enters the housing. Hansen however does disclose the applicants primary inventive structure with the exception of the combination of the injector having the axial swirling means within the injector. However, now that this swirl has been further defined by the applicant including the illustration of Figure 7 which was included in the "Replacement Sheets", the examiner was able to identify that this particular feature is not novel. Joshi et al has now been incorporated in combination with Hansen to meet the applicants claim limitation. (SEE Annotated illustration below). Joshi et al teaches that it is common knowledge in the art to inject gas into the housing of a furnace wherein an axial swirl is created by vanes inside the housing of the injector so that the gas is swirling as it enters the housing of the furnace and the benefits thereof.

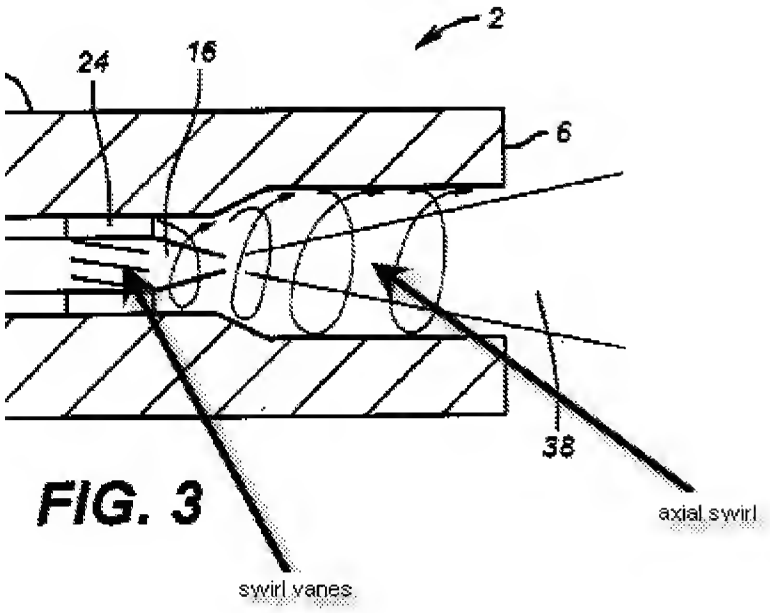

FIG. 3

Annotated Illustration

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY A. WILSON whose telephone number is (571)272-4882. The examiner can normally be reached on 7 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve McAllister can be reached on (571) 272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GREGORY A. WILSON/
Primary Examiner, Art Unit 3749
October 19, 2011